OPERATING INSTRUCTIONS

TYPE 1267-A
REGULATED POWER SUPPLY

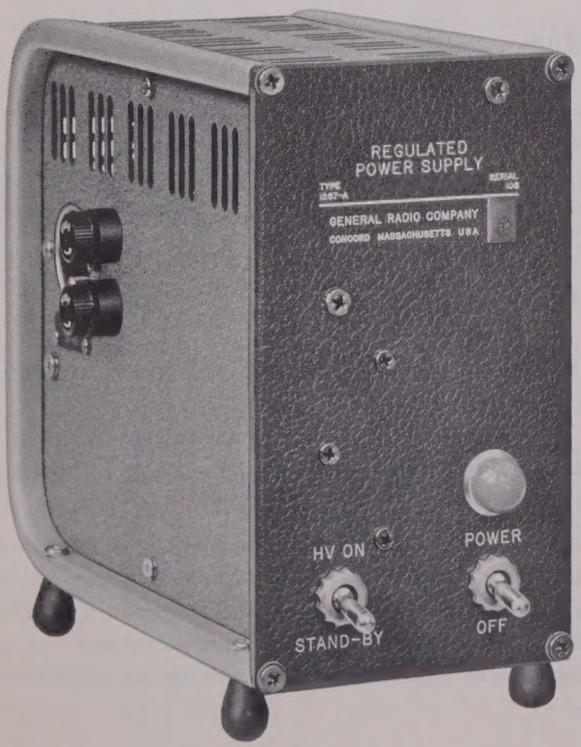

Figure 1. Type 1267-A Regulated Power Supply.

TYPE 1267-A
REGULATED POWER SUPPLY

1 PURPOSE.

The Type 1267-A Regulated Power Supply (Figure 1) is a source of regulated plate and heater voltage designed especially for use with the General Radio Types 1208-C, 1209-C, 1209-CL, 1211-C, 1215-C, and 1361-A oscillators, to which it attaches directly. Connection to other instruments requiring 300 volts dc at 70 ma maximum and 6.3 volts dc at 1 ampere maximum can be made by means of a mating connector supplied.

The Type 1267-A Regulated Power Supply operates on an input of 105 to 125 volts, 50 to 60 cps. The Type 1267-AQ18 operates on 210 to 250 volts. Otherwise, the two models are identical.

2 DESCRIPTION.

The Type 1267-A Regulated Power Supply is housed in a convertible-bench cabinet. On the front panel are the on-off switch, the standby switch, and the indicator light. The output connector is on the right-hand side, and the input power plug is on the left-hand side. A three-wire power cord is supplied.

3 PRINCIPLES OF OPERATION.

3.1 GENERAL. A full-wave voltage doubler with silicon rectifiers provides the input voltage for the series regulator. The output voltage, through a voltage divider, is compared with a reference-tube voltage by means of a differential cascode amplifier. The amplified error voltage is applied to a series regulator tube, through a cathode follower, to provide constant output voltage.

3.2 FEEDBACK. in addition to the main feedback loop described above, two additional signal paths inside this feedback loop are provided for improved performance. A network comprising R512 and C504 reduces the effects of input fluctuations, and R505 is used to make the open-loop gain infinite. This provides a very low output impedance and reduces the effect of load changes on output voltage.

4 INSTALLATION.

4.1 ELECTRICAL CONNECTIONS. Connect the Regulated Power Supply to an ac line (105-125 v, 50-60 cps for the Type 1267-A; 210-250 v, 50-60 cps for the Type 1267-AQ18).

The Type 1267-A will operate the rf Unit oscillators satisfactorily from a 400-cycle line. For other applications requiring maximum output, the minimum line voltage is 107 volts.

To give greater latitude in external connections, both the 6.3-volt and 300-volt dc supplies are isolated from ground and from each other.

4.2 BENCH MOUNTING. The Type 1267-A Regulated Power Supply can be rigidly attached to a Type 1208-C, 1209-C, 1209-CL, 1211-C, or 1215-C Unit Oscillator by means of the narrow adaptor plate and associated screws supplied with the power supply and the clip which is attached to the oscillator L bracket. To attach the units, proceed as follows:

a. Temporarily remove the upper and lower right-hand corner panel screws from the front panel of the power supply. Use these screws to attach the adaptor plate to the power supply, with the left-hand long end of the adaptor plate placed over the right-hand end of the front panel.

b. Remove the front and rear left feet from the oscillator. Using one of the screws removed, attach the clip to the oscillator L bracket in the left rear-foot mounting location. Note that the L bracket hole in this location is tapped 10-32 to receive the mounting screw. Do not replace the feet.

c. Attach the oscillator to the power supply by fastening the upper and lower right-hand corners of the adaptor plate to the corresponding tapped holes in the upper and lower left-hand corners of the oscillator panel. Attach the clip at the left-hand rear of the oscillator to the matching hole in the right-hand side panel of the power supply. The necessary screws and nut are supplied with the power supply.

The Type 1267-A Regulated Power Supply can also be rigidly attached to the left-hand side of a Type 1361-A Oscillator. The power cables are coiled between the cabinets and end frames. To attach the units, proceed as follows:

1. Remove the dust covers from both instruments by unscrewing the two thumbscrews at the rear of each cover and removing the covers.

2. Remove the rubber feet from the right-hand side of the power supply and from the left-hand side of the oscillator.

3. Coil the power cables and plug them in as required.

4. Slip the long 10-32 screws supplied with the power supply through the matching holes near the rear on the side plates of the instruments, starting them through the oscillator side and engaging the nuts on the power-supply side.

5. Secure the front panels of the oscillator and power supply by means of the small adaptor plate supplied with the power supply. The screws which secure the power-supply panel to its right-hand end frame, and the oscillator panel to its left-hand end frame, are temporarily removed while the adaptor plate is put in place, and then the screws are reinstalled.

4.3 RELAY-RACK MOUNTING. To rack-mount the Type 1267-A Regulated Power Supply attached to one of the oscillators mentioned above, a Type 480-P412 Adaptor Plate Set is required. After attaching the power supply to the left-hand side of the oscillator as described in paragraph 4.2, install one adaptor plate on the left-hand side of the combined unit, and the other on the right-hand side. The screws required are supplied with the Adaptor Plate Set.

5 OUTPUT VOLTAGE ADJUSTMENTS.

5.1 300-VOLT ADJUSTMENT. Potentiometer R524 (on the larger etched board; accessible from the rear after the dust cover is removed) is provided to set the output voltage to 300 volts ±1%. Readjustment of the potentiometer is usually unnecessary, except after replacement of V503 (Type 5651). Adjust for 300 volts at the output terminals.

5.2 6.3-VOLT ADJUSTMENT. Potentiometer R559 (behind the standby switch and next to the left-hand side panel; accessible from the bottom after the dust cover is removed) is provided to set the output voltage to 6.3 volts ±1%. Readjustment of the potentiometer is usually unnecessary, except after replacement of CR555. Adjust for 6.3 volts at the output terminals.

6 SERVICE AND MAINTENANCE

6.1 WARRANTY. We warrant that each new instrument sold by us is free from defects in material and workmanship, and that, properly used, it will perform in full accordance with applicable specifications for a period of two years after original shipment. Any instrument or component that is found within the two-year period not to meet these standards after examination by our factory, district office, or authorized repair agency personnel, will be repaired or, at our option, replaced without charge, except for tubes or batteries that have given normal service.

6.2 SERVICE. The two-year warranty stated above attests the quality of materials and workmanship in our products. When difficulties do occur, our service engineers will assist in any way possible. If the difficulty cannot be eliminated by use of the following service instructions, please write or phone our Service Department (see rear cover), giving full information of the trouble

and of steps taken to remedy it. Be sure to mention the serial and type numbers of the instrument.

Before returning an instrument to General Radio for service, please write to out Service Department or nearest district office, requesting a Returned Material Tag. Use of this tag will ensure proper handling and identification. For instruments not covered by the warranty, a purchase order should be forwarded to avoid unnecessary delay.

6.3 FUSES. The Type 1267-A Regulated Power Supply uses 0.8-ampere fuses (the Type 1267-AQ18 uses 0.5-ampere fuses). Fuses are accessible for replacement on the left-hand side of the instrument.

6.4 COVER REMOVAL. To remove the cover, loosen the two fluted locking screws on the back of the instrument. These will unlock on the first turn, but should be loosened the maximum amount before the cover is removed. Pull the cover off the instrument.

When replacing the cover, be sure that the cover engages in the slots on the back of the panel before you tighten the locking screws.

6.5 REMOVAL OF ETCHED BOARDS. To remove the etched boards, proceed as follows:

a. Remove the dust cover.

b. Remove the screws in the left-hand upper and lower corners of the panel.

c. On the left-hand side of the instrument, remove the two screws that secure the large(300-volt regulator)etched board and the screw that attaches to the spacer near the rear of the instrument.

The side panel of the instrument will now swing out on its attached cable. When replacing the side panel, be sure that the cable is below the etched board and not between the board and side panel.

d. On the right-hand side of the instrument, remove the two screws that secure the large etched board. The board will now swing out on its attached cable.

e. To remove the small (6.3-volt regulator) etched board, remove the two screws in the corners of the board and swing the board out on its attached leads.

6.6 TROUBLE-SHOOTING PROCEDURE, 300-VOLT SUPPLY.

6.6.1 Excessive Ripple.

6.6.1.1 120-Cycle Ripple. Measure ripple at full load. If output ripple is excessive only at low line voltages, replace V501 (6AV5GA). If the voltage from the positive terminal of C501 to the negative terminal of C502 is less than 400 volts at full load and 115- (230-) volt line, replace CR501 and CR502. If ripple across C501 and C502 is greater than 6 volts peak-to-peak (2 volts rms), replace C501 and C502.

6.6.1.2 60-Cycle Ripple. If 60-cycle ripple is excessive only at full load, one rectifier (CR501 or CR502) or one capacitor (C501 or C502) is probably faulty. If ripple is independent of load, it may be caused by heater-cathode leakage in V502 (6AN8) or V504 (12AT7). Measure dc voltage from pin 4 or 5 of V504 (12AT7) with a vacuum-tube voltmeter. If this voltage is above 130 volts when the output voltage is 300 volts, V502 (6AN8) probably has excessive heater-cathode leakage. If this voltage is less than 110 volts when the output voltage is 300 volts, V504 (12AT7) probably has heater-cathode leakage. If this voltage is incorrect and tubes are good, check R519, R521, and C506.

6.6.2 Incorrect Output Voltage. If the output voltage is regulated and within a few volts of 300, reset R524 (refer to paragraph 5.1). If this adjustment drifts replace V503 (5651).

If the output voltage drops only at low line and full load, replace V501 (6AV5GA) and check the voltage across C501 and C502. If the voltage from the positive terminal of C501 to the negative terminal of C502, with full load and 115-volt line, is less than 400 volts, check CR501,CR502, C501, and C502.

If the output voltage is completely unregulated, replace V504 (12AT7) and V502 (6AN8). If tubes are not faulty, measure voltages at key points with a vacuum-tube voltmeter, comparing them with those given in Figure 2.

6.7 TROUBLE-SHOOTING PROCEDURE, 6.3-VOLT SUPPLY.

6.7.1 Excessive Ripple.

6.7.1.1 120-Cycle Ripple. Measure ripple at full load (1 ampere). If output ripple is excessive at a 1-ampere load but drops sharply as the load is reduced, the current limiter may be at fault. Check R551, CR553, and Q551. An increased voltage drop from base to emitter on Q551 will cause this difficulty. If output ripple is excessive only at low line voltages, check CR551, CR552, and C551.

6.7.1.2 60-Cycle Ripple. If 60-cycle ripple is excessive at full load, one rectifier (CR551 or CR552) is probably faulty.

6.7.2 Incorrect Output Voltage. If the output voltage is regulated and within a few tenths of a volt of 6.3, reset R559 (refer to paragraph 5.2). If this adjustment drifts, check CR555, R560, R559, and Q553.

If the output voltage is completely unregulated, measure voltages at key points with a vacuum-tube voltmeter, comparing them with those given in Figure 2.

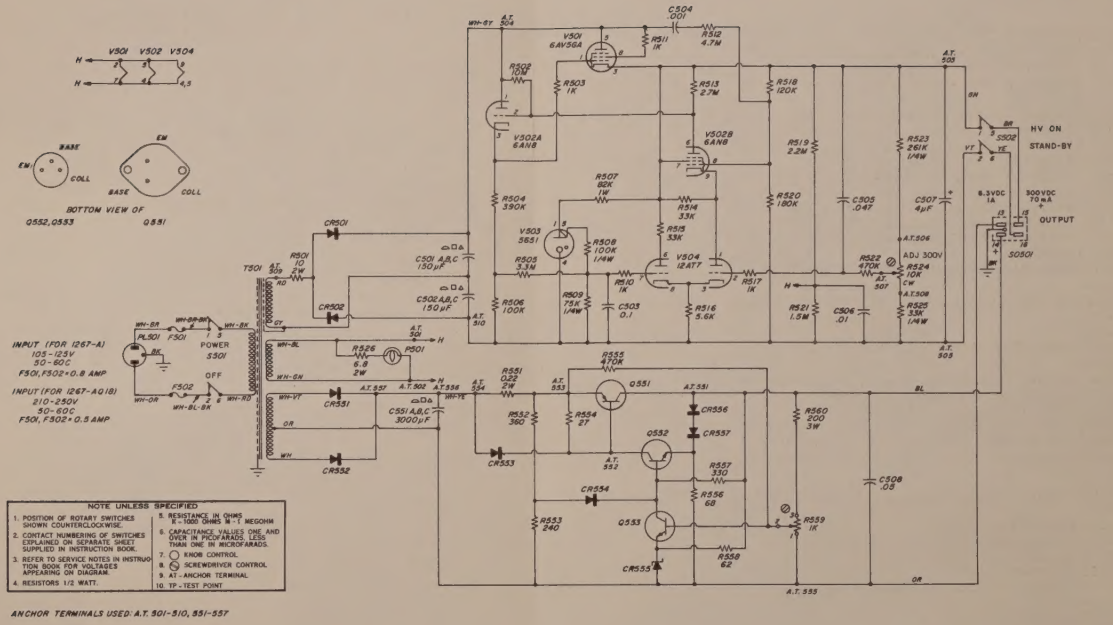

Figure 2. Schematic Diagram for Type 1267-A (or 1267-AQ18) Regulated Power Supply.

PARTS LIST

Ref. No.	Description	Part No.
R501	RESISTOR, Wire-Wound 10Ω ±10% 2w	6760-0109
R502	RESISTOR, Composition 10MΩ ±5% 1/2w	6100-6105
R503	RESISTOR, Composition 1kΩ ±5% 1/2w	6100-2105
R504	RESISTOR, Composition 390kΩ ±5% 1/2w	6100-4395
R505	RESISTOR, Composition 3.3MΩ ±5% 1/2w	6100-5335
R506	RESISTOR, Composition 100kΩ ±5% 1/2w	6100-4105
R507	RESISTOR, Composition 82kΩ ±5% 1w	6110-3829
R508	RESISTOR, Film 100kΩ ±1% 1/4w	6350-3100
R509	RESISTOR, Film 75kΩ ±1% 1/4w	6350-2750
R510	RESISTOR, Composition 1kΩ ±5% 1/2w	6100-2105
R511	RESISTOR, Composition 1kΩ ±5% 1/2w	6100-2105
R512	RESISTOR, Composition 4.7MΩ ±5% 1/2w	6100-5475
R513	RESISTOR, Composition 2.7MΩ ±5% 1/2w	6100-5275
R514	RESISTOR, Composition 33kΩ ±5% 1/2w	6100-3335
R515	RESISTOR, Composition 33kΩ ±5% 1/2w	6100-3335
R516	RESISTOR, Composition 5.6kΩ ±5% 1/2w	6100-2565
R517	RESISTOR, Composition 1kΩ ±5% 1/2w	6100-2105
R518	RESISTOR, Composition 120kΩ ±5% 1/2w	6100-4125
R519	RESISTOR, Composition 2.2MΩ ±5% 1/2w	6100-5225
R520	RESISTOR, Composition 180kΩ ±5% 1/2w	6100-4185
R521	RESISTOR, Composition 1.5MΩ ±5% 1/2w	6100-5155
R522	RESISTOR, Composition 470kΩ ±5% 1/2w	6100-4475

R523	RESISTOR, Film 261kΩ ±1% 1/4w	6350-3261
R524	POTENTIOMETER, Wire-Wound 10kΩ ±10%	6050-1800
R525	RESISTOR, Film 33kΩ ±1% 1/4w	6350-2330
R526	RESISTOR, Wire-Wound 6.8Ω ±10% 2w	Part of 7510-1930
R551	RESISTOR, Wire-Wound 0.22Ω ±10% 2w	6761-9229
R552	RESISTOR, Composition 360Ω ±5% 1/2w	6100-1365
R553	RESISTOR, Composition 240Ω ±5% 1/2w	6100-1245
R554	RESISTOR, Composition 27Ω ±5% 1/2w	6100-0275
R555	RESISTOR, Composition 470kΩ ±5% 1/2w	6100-4475
R556	RESISTOR, Composition 68Ω ±5% 1/2w	6100-0685
R557	RESISTOR, Composition 330Ω ±5% 1/2w	6100-1335
R558	RESISTOR, Composition 62Ω ±5% 1/2w	6100-0625
R559	POTENTIOMETER, Wire-Wound 1kΩ ±10%	6059-2109
R560	RESISTOR	1267-0400
R561	RESISTOR, Composition 4.7Ω ±5% 1/2w	6100-9475
C501A C501B C501C	CAPACITOR, Electrolytic: 90µf / 30µf +100-10% 300dcwv / 30µf	4450-3400
C502A C502B C502C	CAPACITOR, Electrolytic: 90µf / 30µf +100-10% 300dcwv / 30µf	4450-3400
C503	CAPACITOR, Ceramic 0.1µf 0.1(+80-20% 50dcwv	4403-4100
C504	CAPACITOR, Ceramic 0.00µf ±20% 500dcwv	4404-2109
C505	CAPACITOR, Plastic 0.047µf ±10% 400v	4860-7881
C506	CAPACITOR, Ceramic 0.01µf ±20% 500dcwv	4406-3109
C507	CAPACITOR, Electrolytic 4µf ±100-10% 47dcwv	4450-2000
C508	CAPACITOR, Ceramic 0.05µf +80-20% 50dcwv	4403-3500
C551A C551B C551C	CAPACITOR, Electrolytic: 1500µf / 750µf +100-10% 15dcwv / 750µf	4450-2000
CR501	DIODE, Type 1N3255	6081-1003
CR502	DIODE, Type 1N3255	6081-1003
CR551	DIODE, Type 1N3660	6081-1005
CR552	DIODE, Type 1N3660	6081-1005
CR553	DIODE, Type 1N645	6082-1016
CR554	DIODE, Type 1N645	6082-1016
CR555	DIODE, Type 1N750	6083-1003
CR556	DIODE, Type 1N645	6082-1016
CR557	DIODE, Type 1N645	6082-1016
F501	FUSE Type 1267-A, 115-v: 0.8a	5330-1200
	FUSE Type 1267-AQ18, 230-v: 0.5a	5330-1000
F502	FUSE Type 1267-A, 115-v: 0.8a	5330-1200
	FUSE Type 1267-AQ18, 230-v: 0.5a	5330-1000
P501	PILOT LIGHT 6.3 v,	5600-0700
PL501	PLUG	4240-0702
Q551	TRANSISTOR, Type 2N1544	8210-1014
Q552	TRANSISTOR, Type 2N696	8210-1033
Q553	TRANSISTOR, Type 2N1304	8210-1304
S501	SWITCH	7901-1300
S502	SWITCH	7910-1300
T501	TRANSFORMER Type 1267-A, 115-v	0485-4015
	TRANSFORMER Type 1267-AQ18, 230-v	0485-4016
V501	TUBE, Type 6AV5GA	8360-2390
V502	TUBE, Type 6AN8	8360-1300
V503	TUBE, Type 5651	8380-5651
V504	TUBE, Type 12AT7	8370-0200

SPECIFICATIONS

Input: 105 to 125 (210 to 250 for Type 1267-AQ18) volts, 50 to 60 cps, 90 watts full load at 115 volts. Can also be operated from a 110- to 125-volt, 400-cycle supply.

Output: 300 volts dc, 70 milliamperes, maximum; 6.3 volts dc at 1 ampere maximum. Standby switch disconnects high-voltage output.

Ripple: Less than 1 millivolt, rms (120 cps) at full load for both outputs.

Regulation: ±0.25% total for line and load for both outputs

Output Impedance: Approximate dc resistance 2 ohms (300 volts) and 35 milliohms (6.3 volts).

Cabinet: Convertible-bench.

Dimensions: Width 4 1/4, height 7 5/8, depth 9 1/4 inches (110 by 195 by 235 mm), over-all, not including power cord.

Output Connector: Standard 4-terminal receptacle on side of cabinet for convenient connection to rf Unit oscillators.

Accessories Supplied: Three-wire power cord, mating plug for 4-terminal receptacle.

Net Weight: 7 3/4 pounds (3.6 kg).

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Form 1267-0100-A
October, 1963

Printed in U.S.A.